Docket No.: 61282-073 **PATENT**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	:	Customer Number: 20277
Michael PAGE	:	Confirmation Number: 3846
Serial No.: 10/813,627	:	Group Art Unit: 2644
Filed: March 31, 2004	:	Examiner:

For: MODULATED OUTPUT OF DIGITAL AUDIO SIGNALS

TRANSMITTAL OF CERTIFIED PRIORITY DOCUMENT

Mail Stop CPD
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

At the time the above application was filed, priority was claimed based on the following application:

Great Britain Patent Application No. 0307448.1, filed March 31, 2003.

A copy of each priority application listed above is enclosed.

Respectfully submitted,

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The Patent Office

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The Patent Office
Concept House
Cardiff Road
Newport
South Wales
NP10 8QQ

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In accordance with the Patents (Companies Re-registration) Rules 1982, if a company named this certificate and any accompanying documents has re-registered under the Companies Act 1980 with the same name as that with which it was registered immediately before re-registration save for the substitution as, or inclusion as, the last part of the name of the words "public limited company" or their equivalents in Welsh, references to the name of the company this certificate and any accompanying documents shall be treated as references to the name with which it is so re-registered.

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Signed

Dated 15 June 2004

ents Form 1/77

Patents Act 1977
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The Patent Office
31 MAR 2003
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01APR03 E796605-20 D00180
P01/7700 0.00-0307448.1

Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

The Patent Office

Cardiff Road
Newport
South Wales
NP9 1RH

1. Your reference — ABC/21274

2. Patent application number *(The Patent Office will fill in this part)* — 0307448.1 — 31 MAR 2003

3. Full name, address and postcode of the or of each applicant *(underline all surnames)* — Matsushita Electric Industrial Co. Ltd.

   Patents ADP number *(if you know it)* — 05184200?

   If the applicant is a corporate body, give the country/state of its incorporation — 1006 Oaza Kadoma
   Kadoma-shi
   Osaka 571-8501
   Japan
   a Japanese company

4. Title of the invention — Modulated Output of Digital Audio Signals

5. Name of your agent *(if you have one)* — A A THORNTON & CO

   "Address for service" in the United Kingdom to which all correspondence should be sent *(including the postcode)* — 235 HIGH HOLBORN
   LONDON WC1V 7LE

   Patents ADP number *(if you know it)* — 0000075001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and *(if you know it)* the or each application number

Country	Priority application number *(if you know it)*	Date of filing *(day / month / year)*

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application	Date of filing *(day / month / year)*

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? *(Answer 'Yes' if:*
   a) any applicant named in part 3 is not an inventor, or
   b) there is an inventor who is not named as an applicant, or
   c) any named applicant is a corporate body.
   See note (d)) — Yes

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form	
Description	3
Claim(s)	1
Abstract	-
Drawing(s)	1

10. If you are also filing any of the following, state how many against each item.

Priority documents	-
Translations of priority documents	-
Statement of inventorship and right to grant of a patent *(Patents Form 7/77)*	-
Request for preliminary examination and search *(Patents Form 9/77)*	1
Request for substantive examination *(Patents Form 10/77)*	-
Any other documents *(please specify)*	-

11. I/We request the grant of a patent on the basis of this application.

Signature A. A. Thornton & Co. Date 31.03.03

12. Name and daytime telephone number of person to contact in the United Kingdom: Andrew B. CRAWFORD - 020 7440 6854

Warning

After an application for a patent has been filed, the Comptroller of the Patent Office will consider whether publication or communication of the invention should be prohibited or restricted under Section 22 of the Patents Act 1977. You will be informed if it is necessary to prohibit or restrict your invention in this way. Furthermore, if you live in the United Kingdom, Section 23 of the Patents Act 1977 stops you from applying for a patent abroad without first getting written permission from the Patent Office unless an application has been filed at least 6 weeks beforehand in the United Kingdom for a patent for the same invention and either no direction prohibiting publication or communication has been given, or any such direction has been revoked.

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b) *Write your answers in capital letters using black ink or you may type them.*

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MODULATED OUTPUT OF DIGITAL AUDIO SIGNALS

The present invention relates to method and apparatus for modulating digital audio signals more specifically, but not exclusively, audio signals which have been broadcast.

The advent of digital television transmissions and DVD has resulted in an interest in efficient methods of recording digital signals representing video and audio. For example, US-A-4,963,995 discloses a digital recording technique which stores the recorded broadcast in a random access memory comprising the combination of a semi-conductor RAM buffer and a disc memory, permitting a desired programming segment to be immediately accessed and viewed without the time consuming fast-forward and fast-reverse tape motion required in conventional tap recorders.

It is also known that with record players it is common to manually alter the speed of rotation of the turntable and/or to replay the same portion over and over again. This is known as "scratching".

WO-A-02/103671 discloses a digital music player in which a predetermined amount of an audio signal in digital format is stored and the reproduction position and/or direction and/or speed is automatically modulated with respect to the rhythm using control information in different predetermined ways based on information concerning the musical tempo.

It is an object of the present invention to provide a system for modulating audio signals and particularly broadcast audio signals in a relatively inexpensive and convenient fashion which will permit manual intervention in the audio output.

The present invention provides a digital audio system which comprises means for receiving digital audio signals, a buffer storage device for temporarily storing digital audio signals received by the receiving means and a control device for controlling the writing of digital audio signals into the storage means and

reading of digital signals out of the buffer storage means characterised in that the control means is arranged to read-out the signals at a user-controlled rate different to the writing in rate in order to delay and advance the output of stored signals.

Preferably, the direction of reading can also be user-controlled.

In order that the present invention be more readily understood, an embodiment thereof will now be described by way of example with reference to the accompanying drawings in which the figure shows a block diagram of a digital recording system according to the present invention.

A typical receiver apparatus according to the preferred embodiment comprises an antenna 1 which receives broadcast signals which have been encoded according to a desired broadcast standard. The signals are demodulated by a demodulation circuit 2 and then supplied to a decoding circuit 3. In this case, the decoder is an audio decoder for decoding audio signals transmitted using a suitable compression and coding system. After decoding, a small proportion of the received signal is stored in a first-in-first out (FIFO) buffer store 4 and then output to digital to analog converter 5 which in turn feeds one or more output devices which in this case are shown as speakers 6.

The demodulator circuit 2, FIFO store 4, decoding circuit 3 and digital to analog converter 5 are all normally controlled by a CPU 8 in a manner which is well known.

In the embodiment of the present invention, the CPU 8 is provided with an input circuit 10 arranged to receive signals from a device which is manually controlled by the user. Advantageously, the device is a rotary encoder 11as this will more closely resemble the record turntable normally used for "scratching" but a suitable input control device may be used.

When the encoder 11 is used, it causes the CPU to alter the timing of the clocking of the store 4 and also the direction of reading out of the store 4. The

data in the store will be held during this operation. Once the encoder is returned to its initial condition or is switched off, the received broadcast continues to be reproduced.

In order to achieve this with a broadcast signal, the CPU requires a further storage facility to store the incoming broadcast while "scratching" is taking place and this further storage is indicated by reference numeral 12. In turn this also requires two clock signals to be generated by the receiver apparatus, one for use with the storage 12 and one, which is controllable, for use with the FIFO 4.

The CPU 8 controls the buffer store 4 and the storage 12 such that while the buffer store 4 is being user-controlled, the incoming broadcast is automatically stored in the storage 12 but as soon as the user stops manipulating the encoder 11, the contents of the storage are read out into the system.

The above apparatus can be added to by including a facility to allow a removable recording media to be used to input digital signals. One convenient way of doing this would be to include and SD card slot which would allow pre-recorded data to be input instead of broadcast data. This could be further modified to allow data to be received via a USB port in a similar fashion.

CLAIMS:

1. A digital audio system comprising means for storing digital audio signals and a control device for controlling the writing into and reading out from the storing means characterised in that the control device is provided with a manually operable input arrangement for controlling the read-out of the storing means at a manually definable rate.

2. A system according to claim 1, wherein the control means is arranged to alter the control device whereby to alter the direction of reading out of data from the storing means.

3. A system according to claim 1 or 2, and comprising receiving means, and means for demodulating the received signals, the storing means storing demodulated received signals.